Understanding Your School's Profile: From AMO to Z-Score

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Research and Evaluation

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Parts of the AYP Evaluation

- Percent Tested
- Annual Measurable Objectives
- Additional Indicator

- Clear goals (overall and specific)
- Easy to understand
- Easy to compute (with clean data)
- Questionable validity

AYP Who's In and Who's Out

- Percent tested
  - In: all students enrolled 1st day of testing window (3-8); enrolled on testing day (10)
  - Out: No one
- AMO
  - In: students taking AIMS/AIMS A
  - Out: Non-FAY; RALEP
- Grad Rate
  - In: students first enrolled in HS four years ago
  - Out: Students who are institutionalized, die, or transfer to another HS
- Attendance Rate
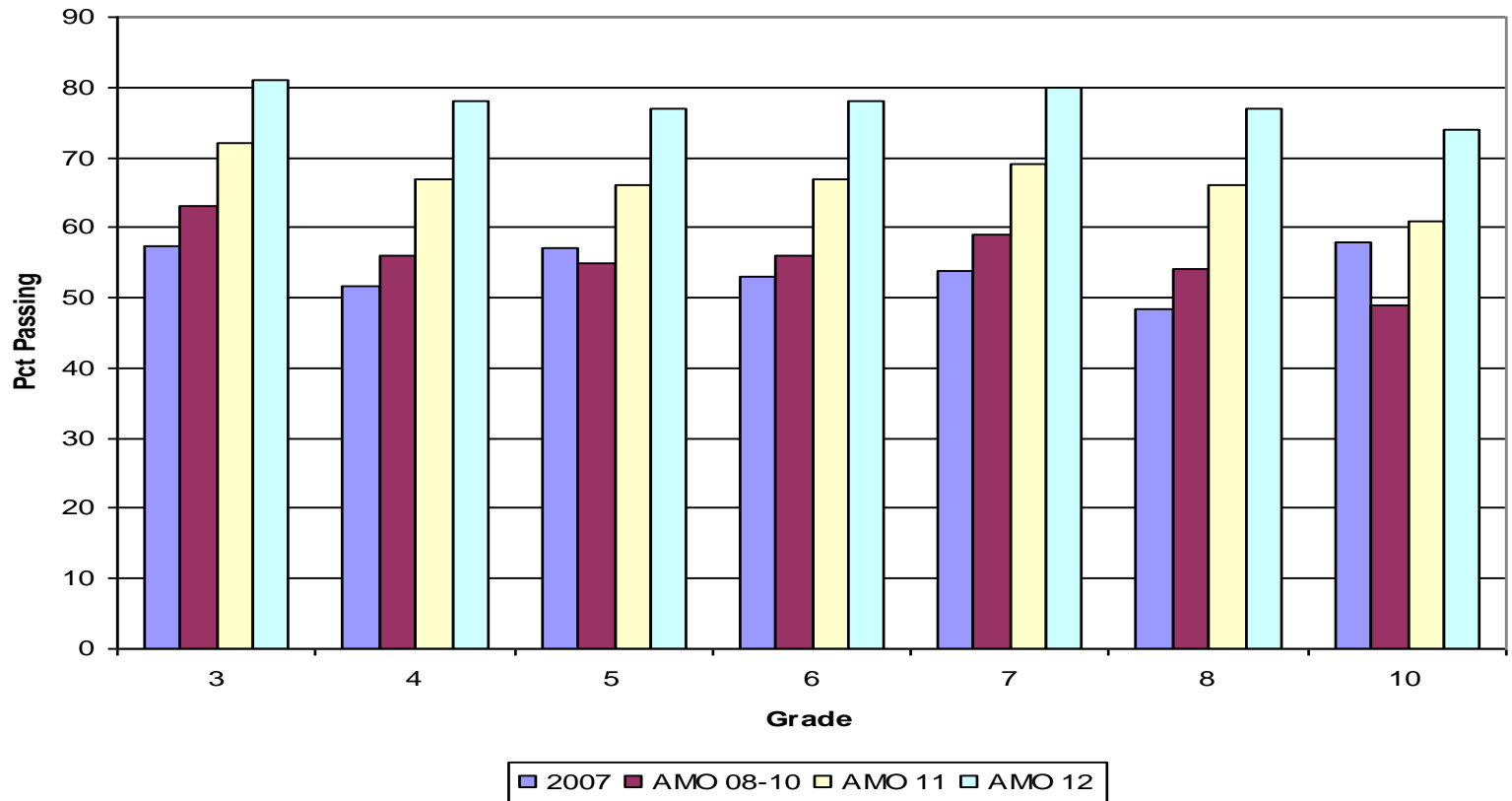 - In: All students enrolled through first 100 days

2007 AYP Results

- 1852 schools evaluated
- 509 (27%) did not make AYP
- 301 missed the goal for percent tested
- 198 missed one or more AMOs
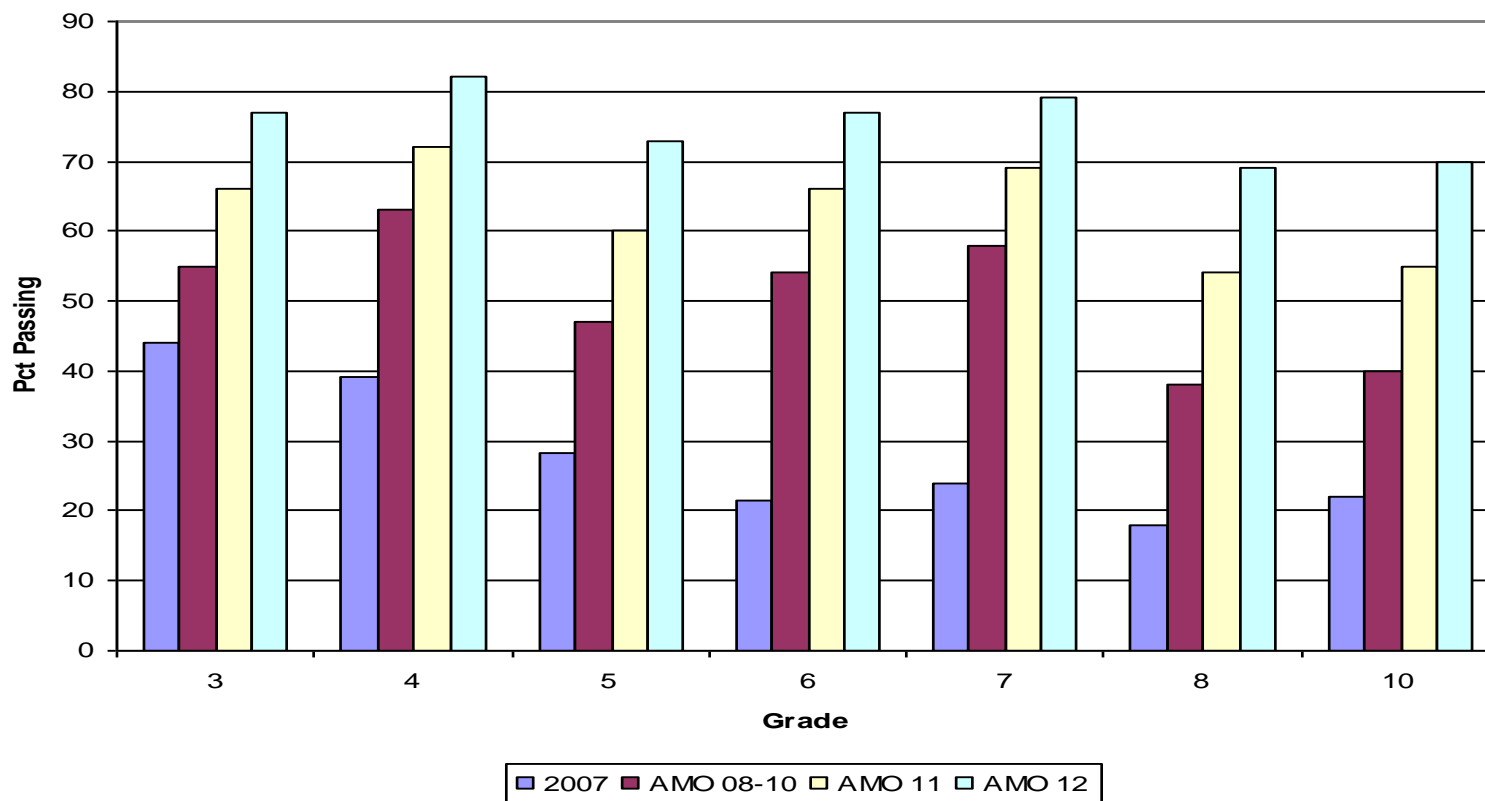- 14 missed the attendance rate
- 99 missed the grad rate
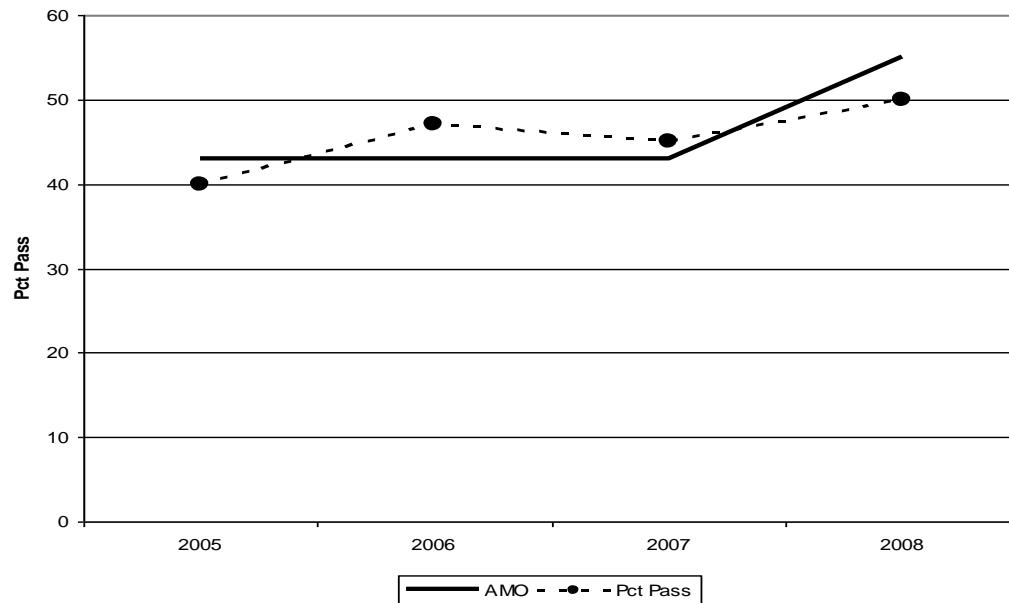
All Students--Math
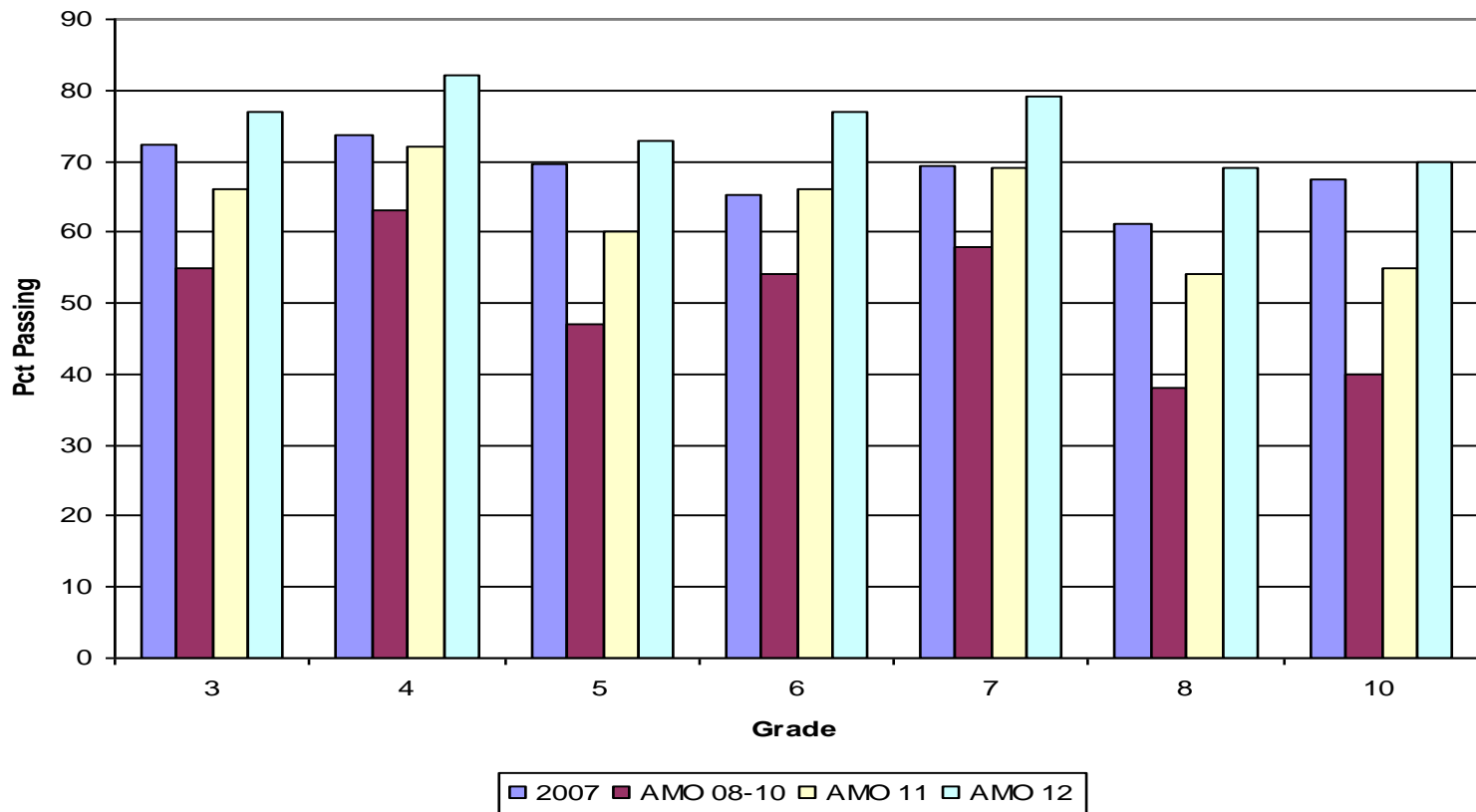
Hispanic--Reading

LEP--Math

Confidence Intervals

- Confidence intervals place a margin of error around school performance

The Confidence Interval

- Error is measured using binomial distribution

$$UB99 = p + 2.33\sqrt{p(1-p)/n}.$$

p = percent passing AIMS;
n = number of students;
UB99 = upper bound of confidence interval

The Confidence Interval: Example

- Group size (n) = 40
- Percent passing (p) = 40%
- Upper bound of confidence interval (UB99)=

$$\mathrm{UB99} = .40 + 2.33\sqrt{.40(1-.40)/40}.$$

- = .58 = 58%

Fun with Confidence Intervals

N	P	UB99	Difference
40	40%	58%	18
50	40%	56%	16
100	40%	51%	11

Fun with Confidence Intervals II

N	P	UB99	Difference
40	30%	47%	17
40	40%	58%	18
40	60%	78%	18

Parts of AZ LEARNS Evaluation

- AIMS (18 pts.)
  - Status
  - Improvement/Growth
- MAP (Measure of Academic Progress) (8 pts.)
- Graduation/Dropout Rates (2 pts.)
- AZELLA (1 pt.)
- AYP (1 pt.)

Status

Year	2005	2006	2007
Grade 3	% pass	% pass	% pass
Grade 4	% pass	% pass	% pass
Grade 5	% pass	% pass	% pass
Grade 6	% pass	% pass	% pass

Improvement/Growth

Year	2005	2006	2007
Grade 3	% pass **Change** →	% pass →	% pass →
Grade 4	% pass **Change** →	% pass →	% pass →
Grade 5	% pass **Change** →	% pass →	% pass →
Grade 6	% pass **Change** →	% pass →	% pass →

Measure of Academic Progress

Year	2005	2006	2007
Grade 3	Change		Change
Grade 4			
Grade 5		Change	
Grade 6	Change		

Status (3rd Grade Math)

Pctile.	10th	25th	50th	75th	90th
1	2	3	4	5	6
Pct Pass	51%	65%	79%	89%	95%

Growth (Math 3-8)

Pctile.	16th	21st	50th	69th	84th
1	2	3	4	5	6

Change	-16	-8	1	10	18

Measure of Academic Progress (MAP)

- An individual expectation of one year's growth (OYG) is calculated for each student and subject

- The expectation of OYG is subtracted from the actual growth achieved by the student to determine a Growth Index

- The average Growth Index for school is calculated by averaging Growth Indices for individual students across all grades and subjects.

Expected Growth (MAP)

Expected Growth =

$$A + B \times (\text{last year's scale score}) + C \times (\text{FAY})$$

For 7th grade math

A = 121.1295

B = -0.1896

C = 7.1203

Calculating MAP for a Student

- Student A:
  - 478 on the 6th grade math test in 2006;
  - enrolled in current school all year;
  - expected growth for 7th grade in 2007
    $$121.1295 + (-0.1896) \times 478 + 7.1203 = 37.62$$
    $$= 38$$
  - Actual growth = 528 − 478 = 50
  - Growth Index = 50 − 38 = 12

Calculating MAP for a School

- AZ LEARNS points:

$$5.2 + .22 \text{ X (School's growth index)}$$

- Example: School A
  - Growth Index is -1.7.
  - AZ LEARNS MAP points awarded
  - $5.2 + .22 \text{ X } (-1.7) = 4.8$

MAP Results 2007

MAP Points	Percent of Schools
2-2.9	9
3-3.9	17
4-4.9	28
5-5.9	19
6-6.9	18
7+	9

Highly Performing/Excelling

At school A 8 percent of students exceeded the standard. How does this compare to other schools?

3rd grade state average 12 percent

8th grade state average 5 percent

Highly Performing/Excelling

At school A the percentage of students exceeding the standard is 6 percentage points above the average. Is this good?

3rd grade: 74th percentile

8th grade state average 85th percentile

The Amazing Z-Score

- The z-score allows us to compare percent exceeding across grades with standard measure by:
  - Subtracting the average per grade
  - Dividing by the standard deviation
- .45 = 67th percentile
- 1.00 = 84th percentile

Z-Score Example

Year	Number tested math, reading, and writing 8th Grade	Number exceeding math, reading, and writing 8th Grade
2005	45	6
2006	50	7
2007	55	7

Z-Score Example

3-yr average % exceeding = (6+7+7)/ (45 + 50 +55)

= 20/150 = 0.133;

z-score = (.133 - .06)/ .07 = 1.04

Average across grades =

(0.95 + 1.06 +1.04)/ 3 = 1.02 > 1.00

How To Make Excelling

Increasing the percent exceeding by 1% in this grade…	Increases the school Z-score by this number of AIMS grades
3	0.11
4	0.11
5	0.12
6	0.12
7	0.15
8	0.18
10	0.12

Example: Gila Monster Middle School

- 6th Grade: Z-score .35
- 7th Grade: Z-score .40
- 8th Grade: Z-score .45
- School average: .40

If I raise 6th grade percent exceeding by 5 percent, how much will I raise my school's z-score?

Example: Gila Monster Middle School

If I raise 6th grade percent exceeding by 5 percent, how much will I raise my school's z-score?

You will raise your 6th grade z-score by 5 X .12 = .6 to .41

You will raise your school's z-score to (.41 + .40 + .45)/3 = .42

.42 - .40 = .02 Which also equals .6/3.

When Benchmarks Were Set

Measure	Last Set
Status	2005
Growth	2008
MAP	2006
Excelling/HP (z-scores)	2006